10/820,200

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=> d his

     (FILE 'HOME' ENTERED AT 14:39:48 ON 28 JUN 2005)

     FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS,
     LIFESCI' ENTERED AT 14:40:24 ON 28 JUN 2005
L1         51978 S ALPHA(W)AMYLASE?
L2         15362 S ASPERGILLUS (W)ORYZAE
L3          2086 S L1 AND L2
L4            93 S FUNGAMYL
L5            14 S L3 AND L4
L6            13 DUP REM L5 (1 DUPLICATE REMOVED)
L7         68103 S THERMOSTAB?
L8            92 S L3 AND L7
L9        150853 S DOUGH OR BREW OR BEER OR ALCHOHOL OR MALTOSE
L10           15 S L8 AND L9
L11           11 DUP REM L10 (4 DUPLICATES REMOVED)
L12          811 S L2 AND IMMOBILIZ?
L13            2 S L4 AND L12
                 E BISGARD-FRANTZEN H/AU
L14            2 S E4
                 E SVENDSEN A/AU
L15          375 S E3
                 E PEDERSEN S/AU
L16         1367 S E3
L17         1742 S L14 OR L15 OR L16
L18            5 S L3 AND L17
L19            3 DUP REM L18 (2 DUPLICATES REMOVED)
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NEWS	13	APR 04	EMBASE - Database reloaded and enhanced
NEWS	14	APR 18	New CAS Information Use Policies available online
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NEWS	16	APR 28	Improved searching of U.S. Patent Classifications for U.S. patent records in CA/CAplus
NEWS	17	MAY 23	GBFULL enhanced with patent drawing images
NEWS	18	MAY 23	REGISTRY has been enhanced with source information from CHEMCATS
NEWS	19	JUN 06	STN Patent Forums to be held in June 2005
NEWS	20	JUN 06	The Analysis Edition of STN Express with Discover! (Version 8.0 for Windows) now available
NEWS	21	JUN 13	RUSSIAPAT: New full-text patent database on STN
NEWS	22	JUN 13	FRFULL enhanced with patent drawing images
NEWS	23	JUN 20	MEDICONF to be removed from STN
NEWS	24	JUN 27	MARPAT displays enhanced with expanded G-group definitions and text labels

NEWS EXPRESS	JUNE 13 CURRENT WINDOWS VERSION IS V8.0, CURRENT MACINTOSH VERSION IS V6.0c(ENG) AND V6.0Jc(JP), AND CURRENT DISCOVER FILE IS DATED 13 JUNE 2005
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=> s alpha(w)amylase?
L1        51978 ALPHA(W) AMYLASE?

=> s aspergillus (w)oryzae
L2        15362 ASPERGILLUS (W) ORYZAE

=> s l1 and l2
L3         2086 L1 AND L2

=> s fungamyl
L4           93 FUNGAMYL

=> s l3 and l4
L5           14 L3 AND L4

=> dup rem l5
PROCESSING COMPLETED FOR L5
L6           13 DUP REM L5 (1 DUPLICATE REMOVED)

=> d 1-13 ibib ab
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L6 ANSWER 1 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2004:534312 HCAPLUS
DOCUMENT NUMBER: 141:67294
TITLE: Cloning, purification and characterization of thermostable .**alpha**.-**amylase** from Rhizomucor pusillus, and use in liquefying starch, production of alcohol, brewing and baking
INVENTOR(S): Tang, Lan; Wu, Wenping; Duan, Junxin; Johannesen, Pia Francke
PATENT ASSIGNEE(S): Novozymes A/S, Den.
SOURCE: PCT Int. Appl., 53 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004055178	A1	20040701	WO 2003-DK882	20031216
WO 2004055178	C2	20041007		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.: DK 2002-1928 A 20021217
AB The present inventors have successfully isolated a gene from Rhizomucor pusillus encoding an **alpha-amylase** which they have denoted AM782, they have successfully introduced the encoding gene into a recombinant industrial filamentous fungal expression system, and produced the **alpha-amylase**. Characterization of the amylase has shown it to be a highly thermoacidophilic **alpha-amylase** which has a highly interesting activity as demonstrated by the sugar profile from maltodextrin hydrolysis by amylase AM782. The amylase AM782 can work at a very high temperature, at least up to 70°. The amylase AM782 has a very fast reaction speed; when compared at the same dosage with **Fungamyl** 800 L, the amylase AM782 can achieve in about 3 h, what takes **Fungamyl** 24 to 48 h. Purification and characterization of the **alpha-amylase** from Rhizomucor pusillus NN046782 is described. Cloning of the gene encoding the AM782 **alpha-amylase** of Rhizomucor pusillus NN046782 and subcloning and heterologous expression of AM782 amylase is also described. The thermoacidophilic **alpha-amylase** of the invention can be used in starch conversion for liquefaction and saccharification, for liquefying starch in a high maltose syrup, for producing alc., for textile desizing, and for brewing and baking.
REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 2 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:997295 HCAPLUS
DOCUMENT NUMBER: 141:102002
TITLE: Heat inactivation of **Aspergillus oryzae** .**alpha**.-**amylase** at high and reduced water content
AUTHOR(S): Samborska, K.; Guiavarc'h, Y.; Van Loey, A.;

Hendrickx, M.
CORPORATE SOURCE: Laboratory of Food Technology, Department of Food and Microbial Technology, Katholieke Universiteit Leuven, Heverlee, B-3001, Belg.
SOURCE: Mededelingen - Faculteit Landbouwkundige en Toegepaste Biologische Wetenschappen (Universiteit Gent) (2003), 68(3), 247-250
CODEN: MFLBER; ISSN: 1373-7503
PUBLISHER: Universiteit Gent, Faculteit Landbouwkundige en Toegepaste Biologische Wetenschappen
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The influence of water content on the kinetic parameters of heat inactivation of **Aspergillus oryzae** .**alpha**.-**amylase** was studied. Isothermal inactivation kinetics of **Aspergillus oryzae** .**alpha**.-**amylase** in both systems followed a first-order model. The influence of water content on the thermal stability of .**alpha**.-**amylase** was found to be significant. .**alpha**.-**Amylase** in maltodextrin system at reduced moisture content was much more thermostable than in solution The temperature range of inactivation in the reduced water content system was 100-115° compared to 62.5-70° for inactivation in aqueous solution The decrease of water content had also a significant effect on the z-value for thermal inactivation of **Aspergillus oryzae** .**alpha**.-**amylase**.
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 3 OF 13 BIOTECHDS COPYRIGHT 2005 THE THOMSON CORP. on STN
DUPLICATE 1
ACCESSION NUMBER: 2001-12290 BIOTECHDS
TITLE: New variant of **Fungamyl**-like **alpha**-**amylase**, useful for production of maltose syrups, includes mutations that improve stability against heat and acidic pH;
plasmid pTAKA17 expression in bacterium cell for syrup production, dough improvement, brewing and starch liquefaction
AUTHOR: Bisgard-Frantzen H; SvendSen A; Pedersen S
PATENT ASSIGNEE: Novozymes
LOCATION: Bagsvaerd, Denmark.
PATENT INFO: WO 2001034784 17 May 2001
APPLICATION INFO: WO 2000-DK626 10 Nov 2000
PRIORITY INFO: DK 1999-1617 10 Nov 1999
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: WPI: 2001-367478 [38]
AB A variant (A) of a **Fungamyl**-like **alpha**-**amylase** (EC-3.2.1.1) is claimed. (A) has alteration in one of the disclosed amino acid regions. Each alteration is a deletion or substitution of an amino acid an or insertion of an amino acid downstream of a particular position, and (A) retains **alpha**-**amylase** activity. Also claimed are: DNA construct (II); recombinant expression vector (III); a cell (IV) transformed with the (II) or (III); composition for producing high maltose syrup (HMS) or alcohol; dough improving or brewing composition; producing (M1) of liquefied starch, HMS or alcohol using (A); producing (M2) variants of **Fungamyl**-like enzymes with increased thermostability; production (M3) of (maltose) syrup; and immobilized (A). (A) is used for producing syrups, e.g. of high maltose content, or alcohol from starch, as dough improver for baked goods, in brewing, to increase fermentability of the wort, and for liquefaction of starch. (47pp)

L6 ANSWER 4 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1998:475162 HCAPLUS
DOCUMENT NUMBER: 129:177135
TITLE: Enzymic degradation of native and acetylated starch-based extruded blends
AUTHOR(S): Copinet, Alain; Coma, Veronique; Onteniente, Jean Paul; Couturier, Yves
CORPORATE SOURCE: Groupe Rech. Emballage Produit Alimentaire Compatibilite, Reims, 51686, Fr.
SOURCE: Packaging Technology & Science (1998), 11(2), 69-81
CODEN: PTSCEQ; ISSN: 0894-3214
PUBLISHER: John Wiley & Sons Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Blends including natural wheat starch and acetylated starch (with substitution degree 1.5) have been extruded so as to obtain a new packaging material. The influence of this extrusion upon the biodegradability of the blends was studied for several acetylated to natural starch ratios both by a colorimetric method (measure of reducing sugars) and by chromatog. anal. (determination of quantities of degradation products).

The action of a single .**alpha**.-**amylase** (**Fungamyl** 800 from **Aspergillus oryzae**) only leads to degradation of the unmodified part of the starch. On the other hand, an acetylesterase (Viscozyme from Aspergillus niger) acting in synergy with the same .**alpha**.-**amylase** leads to significant degradation of the two major components of the extruded blends. For instance, with 10% acetylated starch 100% of the blend is degraded. The major product of degradation is glucose (97%) because Viscozyme also has α-glucosidase activity. SO, the present study shows the degradable character of this new packaging material even with a high acetylation value.

REFERENCE COUNT: 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 5 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1996:584142 HCAPLUS
DOCUMENT NUMBER: 125:241792
TITLE: A method of designing **alpha-amylase** mutants with predetermined properties, **alpha-amylase** variants, and detergents containing the variants
INVENTOR(S): Svendsen, Allan; Bisgaard-Frantzen, Henrik; Borchert, Torben Vedel
PATENT ASSIGNEE(S): Novo Nordisk A/s, Den.
SOURCE: PCT Int. Appl., 171 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9623874	A1	19960808	WO 1996-DK57	19960205

W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI
RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE

CA 2211316	AA	19960808	CA 1996-2211316	19960205
AU 9644834	A1	19960821	AU 1996-44834	19960205
BR 9607013	A	19971028	BR 1996-7013	19960205
EP 808363	A1	19971126	EP 1996-900895	19960205
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, PT, IE				
CN 1172501	A	19980204	CN 1996-191745	19960205
JP 11500003	T2	19990106	JP 1996-523187	19960205
US 5989169	A	19991123	US 1996-600908	19960213
US 6022724	A	20000208	US 1996-683838	19960718
US 6440716	B1	20020827	US 2000-636252	20000810
US 2003170769	A1	20030911	US 2002-184771	20020628
US 2005019886	A1	20050127	US 2004-926720	20040826
PRIORITY APPLN. INFO.:			DK 1995-128	A 19950203
			DK 1995-1192	A 19951023
			DK 1995-1256	A 19951110
			WO 1996-DK57	W 19960205
			US 1996-600908	A2 19960213
			US 1996-683838	A1 19960718
			US 1999-325603	B1 19990603
			US 1999-327563	A1 19990608
			US 2000-636252	A1 20000810

AB A method of constructing a variant of a parent Termamyl-like .**alpha**.-**amylase**, which variant has .**alpha**.-**amylase** activity and at least one altered property as compared to the parent .**alpha**.-**amylase**, comprises i) analyzing the structure of the parent Termamyl-like .**alpha**.-**amylase** to identify at least one amino acid residue or at least one structural part of the Termamyl-like .**alpha**.-**amylase** (as evaluated on the basis of structural or functional considerations), ii) constructing a Termamyl-like .**alpha**.-**amylase** variant, which as compared to the parent Termamyl-like .**alpha**.-**amylase**, has been modified in the amino acid residue or structural part identified in i) so as to alter the property, and iii) testing the resulting Termamyl-like .**alpha**.-**amylase** variant for the property in question. The resulting Termamyl variants and detergents containing the variants are claimed. [Trp-54]- and [Trp-52,Trp-54]-Termamyl variants were prepared with recombinant Bacillus subtilis. Model building had identified these residues as being important for substrate specificity. Alteration of these residues altered the substrate specificity to be more like that of **Fungamyl** (**Aspergillus oryzae** .**alpha**.-**amylase**).

L6 ANSWER 6 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER:	1995:998220 HCAPLUS
DOCUMENT NUMBER:	124:120817
TITLE:	Amylase-containing detergent compositions
INVENTOR(S):	Bettiol, Jean-Luc Philippe; Moss, Michael Alan John; Thoen, Christaan Arthur Jacques Kamiel; Boyer, Stanton Lane; Showell, Michael Stanford; Jeffrey, Janice
PATENT ASSIGNEE(S):	Procter and Gamble Co., USA
SOURCE:	PCT Int. Appl., 40 pp. CODEN: PIXXD2
DOCUMENT TYPE:	Patent
LANGUAGE:	English
FAMILY ACC. NUM. COUNT:	1
PATENT INFORMATION:	

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9529224	A1	19951102	WO 1995-US4710	19950417
W: AM, AU, BB, BG, BR, BY, CA, CN, CZ, EE, FI, GE, HU, IS, JP, KG, KP, KR, KZ, LK, LR, LT, LV, MD, MG, MN, MX, NO, NZ, PL, RO, RU, SG, SI, SK, TJ, TT, UA, US, UZ, VN				

RW: KE, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG

CA 2188403	AA	19951102	CA 1995-2188403	19950417
AU 9522935	A1	19951116	AU 1995-22935	19950417
EP 756619	A1	19970205	EP 1995-916433	19950417
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, NL, PT, SE				
CN 1151177	A	19970604	CN 1995-193743	19950417
BR 9507397	A	19971007	BR 1995-7397	19950417
JP 10501825	T2	19980217	JP 1995-527702	19950417
US 5783546	A	19980721	US 1996-722088	19961018
PRIORITY APPLN. INFO.:			EP 1994-302878 A	19940422
			WO 1995-US4710 W	19950417

AB A detergent composition comprises an amylase enzyme [50-500 FAU (fungal **alpha.-amylase** units)/100 g] which shows CMCase activity (e.g., **Fungamyl**) and/or is an amylase showing a pos. immunol. cross reaction with the antibody of the **Fungamyl** amylase, or an amylase produced by a host organism in which the gene encoding the **Fungamyl** amylase has been cloned. **Fungamyl** is a com. 1,4-α-D-glucan glucano-hydrolase obtained from a strain of **Aspergillus oryzae**, and was previously believed to be inactive in alkaline media.

L6 ANSWER 7 OF 13 BIOTECHDS COPYRIGHT 2005 THE THOMSON CORP. on STN
ACCESSION NUMBER: 1992-10941 BIOTECHDS
TITLE: Removing cyclodextrin residues from fat and oil; lipid treatment with **alpha-amylase** or cyclomaltodextrin-glucanotransferase in an aqueous emulsion
PATENT ASSIGNEE: SKW-Trostberg
PATENT INFO: DE 4041386 25 Jun 1992
APPLICATION INFO: DE 1990-41386 21 Dec 1990
PRIORITY INFO: JP 1990-41386 21 Dec 1990
DOCUMENT TYPE: Patent
LANGUAGE: German
OTHER SOURCE: WPI: 1992-217941 [27]
AB Residues of cyclodextrin are removed from fats and oils (lipids) by emulsifying the lipid in water and enzymatically degrading the cyclodextrin using **alpha-amylase** (EC-3.2.1.1) and/or cyclomaltodextrin-glucanotransferase (EC-2.4.1.19). Cyclodextrin is added to lipid to remove cholesterol, free fatty acids, vitamins and pigments, and its removal is important for use of lipid as food. After enzyme treatment, the residual cyclodextrin content is below 10 ppm. The **alpha-amylase** is derived from Aspergillus niger, **Aspergillus oryzae**, Bacillus polymyxa, Bacillus coagulans, Flavobacillus sp. or from pig pancreas, and used at 10-500 U/g cyclodextrin. Cyclomaltodextrin-glucanotransferase is derived from alkalophilic Klebsiella or Micrococcus spp., and used at 0.5-20 U/g cyclodextrin. Treatment is between the melting point of the lipid and 70 deg (preferably 25-55 deg). In an example, fish oil pretreated with beta-cyclodextrin was emulsified in 1 kg water at 40 deg and pH 5.5, and treated with 50 U **fungamyl** 800 (A. oryzae **alpha-amylase**). After 2 hr, beta-cyclodextrin was undetectable (initially 150 ppm). (3pp)

L6 ANSWER 8 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1991:407379 HCAPLUS
DOCUMENT NUMBER: 115:7379
TITLE: Removal of β-cyclodextrin from egg yolk with **alpha.-amylase**
INVENTOR(S): Cully, Jan; Vollbrecht, Heinz Ruediger
PATENT ASSIGNEE(S): SKW Trostberg A.-G., Germany
SOURCE: Ger., 3 pp.

CODEN: GWXXAW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 4001611	C1	19910228	DE 1990-4001611	19900120
CA 2029916	AA	19910721	CA 1990-2029916	19901114
CA 2029916	C	19950912		
ZA 9009368	A	19911030	ZA 1990-9368	19901122
HU 61332	A2	19921228	HU 1991-37	19910108
HU 212921	B	19961230		
JP 04341161	A2	19921127	JP 1991-3300	19910116
FI 9100278	A	19910721	FI 1991-278	19910118
PL 166697	B1	19950630	PL 1991-288756	19910118
CZ 279870	B6	19950712	CZ 1991-127	19910121

PRIORITY APPLN. INFO.: DE 1990-4001611 A 19900120

AB β-Cyclodextrin, which is used to remove cholesterol and cholesterol esters from egg yolk by complexation, is subsequently itself removed to a level of <100 ppm by treatment with .**alpha**.-**amylase** from Aspergillus niger, A. oryzae, Bacillus polymyxa, B. coagulans, Flavobacterium, or swine pancreas. Thus, 1 kg pretreated egg yolk containing 0.25% β-cyclodextrin was incubated with **Fungamyl** for 2 h at 40° and pH 5.5.

L6 ANSWER 9 OF 13 BIOTECHDS COPYRIGHT 2005 THE THOMSON CORP. on STN
ACCESSION NUMBER: 1992-02329 BIOTECHDS
TITLE: Enzymatic hydrolysis of wheat starch with various amylases; **alpha-amylase**
AUTHOR: Kaprelyants L V; Tarakhtiy L V; Styngach I V
LOCATION: M. V. Lomonosov Odessky Technological Institute of Food Industry, Odessa, 270039, USSR.
SOURCE: Biotekhnologiya; (1991) 6, 50-52
CODEN: BTKNEZ
DOCUMENT TYPE: Journal
LANGUAGE: Russian

AB Wheat starch hydrolysis was investigated using the following amylase preparations: (a) Amylosubtilin G10x (3,500 U/g); (b) Amylorizin P10x (1,600 U/g); and (c) **alpha-amylase** (EC-3.2.1.1) **Fungamyl** L from **Aspergillus oryzae** (4,500 U/g). Wheat starch fractions I (20-25 um grains) and II (2-5 um grains) were produced by sedimentation and centrifugation. Fermentative hydrolysis of wheat starch (15 mg/ml) was performed at pH 6 and varying temperature in a reactor with constant mixing (250 rpm). The carbohydrates composition of the hydrolyzates was determined by liquid chromatography on DEAE-SI 100 and gel filtration on Sephadex G-50. Production of reducing compounds (%) from both wheat fractions I and II increased with time (5-90 min) for Amylosubtilin G10x, Amylorizin P10x and **Fungamyl** 800. A maximum of 32.4% was obtained from fraction I with **Fungamyl** 800 after 90 min. Investigation of the oligosaccharide content of the wheat fraction hydrolyzates revealed the presence of glucose, maltose, maltotriose, maltopentaose, maltohexaose, maltoheptaose and high mol.weight dextrin. (14 ref)

L6 ANSWER 10 OF 13 BIOTECHDS COPYRIGHT 2005 THE THOMSON CORP. on STN
ACCESSION NUMBER: 1990-10258 BIOTECHDS
TITLE: Action pattern of **alpha-amylase** from **Aspergillus oryzae** in concentrated media; influence of concentrated maltotetraose solution on activity and specificity

AUTHOR: Graber M; Combes D
LOCATION: Departement de Genie Biochimique et Alimentaire, UA-CNRS 544, Institut National des Sciences Appliquees, Avenue de Rangueil, F-31077 Toulouse, France.
SOURCE: Biotechnol.Bioeng.; (1990) 36, 1, 12-18
CODEN: BIBIAU
DOCUMENT TYPE: Journal
LANGUAGE: English

AB **Aspergillus oryzae alpha-amylase** (EC-3.2.1.1) was purified to homogeneity from **Fungamyl** 800 L (Novo), and its behavior in concentrated solutions of maltotetraose was determined. Substrate inhibition did not occur at 500 g/l (750 mM) maltotetraose concentration. An apparent decrease of hydrolysis rate at this concentration was due to an increase in the number of transglycosylation reactions. These transglycosylation reactions increased with rising substrate concentration from 20 to 200 g/l and from 200 to 500 g/l, although the maximum percentage of oligosaccharides with polymerization degree higher than the starting substrate did not exceed 20% weight/weight The presence of polyols (water activity depressors), such as glycerol, xylitol and sorbitol, did not modify the transglycosylation products, but altered the hydrolysis pattern by favoring the formation of low polymerization degree oligosaccharides. This modification pattern might involve, besides direct interactions of polyols with the binding or active site of the enzyme, an indirect effect of the additive on the microenvironment of the protein. (15 ref)

L6 ANSWER 11 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1983:435068 HCAPLUS
DOCUMENT NUMBER: 99:35068
TITLE: Characterization of microbial **alpha-amylases** by analytical determination of the products of starch hydrolysis
AUTHOR(S): Klenz, G.; Krueger, M.; Pantschev, C.; Fabian, G.
CORPORATE SOURCE: Inst. Tech. Mikrobiol., Berlin, Ger. Dem. Rep.
SOURCE: Lebensmittelindustrie (1983), 30(3), 128-30
CODEN: LEINAQ; ISSN: 0024-0028
DOCUMENT TYPE: Journal
LANGUAGE: German

AB The starch degradation products of com. Bacillus subtilis .**alpha**.-**amylases** BAN 240, Amylase 80x, Dexlo 50, and ZF 178; the B. licheniformis .**alpha**.-**amylase**, Termamyl, and the **Aspergillus oryzae** .**alpha**.-**amylase**, **Fungamyl**, were determined qual. by paper chromatog. and quant. by high-performance liquid chromatog. Both methods allow good separation up to G6 components. Both qual. and quant. similar degradation products were found by examination of the various amylases of B. subtilis. However, the quant. pattern of starch degradation products from B. licheniformis amylase was different from that of the B. subtilis enzymes, and both the qual. and quant. patterns of products from Termamyl were different from those of the bacterial enzymes. The usefulness of these expts. and the methods used in evaluating the optimum application of .**alpha**.-**amylases** in the brewing industry are discussed.

L6 ANSWER 12 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1981:402402 HCAPLUS
DOCUMENT NUMBER: 95:2402
TITLE: Comparative characterization of .**alpha**.-**amylase** preparations
AUTHOR(S): Pantschev, C.; Klenz, G.; Haefner, B.
CORPORATE SOURCE: Inst. Enzymol. Tech. Mikrobiol., Berlin, Ger. Dem.

Rep.
SOURCE: Lebensmittelindustrie (1981), 28(2), 71-4
CODEN: LEINAQ; ISSN: 0024-0028
DOCUMENT TYPE: Journal
LANGUAGE: German
AB The simultaneous influence of pH, temperature, substrate, and Ca2+ on some .**alpha**.-**amylase** prepns. (BAN 240, amylase 80+, Dexlo 50, and .**alpha**.-**amylase** ZF-178 from Bacillus subtilis and **Fungamyl** 800 L from **Aspergillus oryzae**) was analyzed under conditions analogous to those in distilleries. No significant differences were observed between the pH and temperature dependences of prepns. from B. subtilis. All prepns. showed highest activity at 55-60° and pH 5.5-6.0. In addition to the stabilization provided by Lintner starch in these pH and temperature ranges, an addnl. stabilization by Ca2+ was necessary at temps. ≤80° and pH values ≤4.5. **Fungamyl** showed better pH stability but had a low thermal stability. Some differences were observed between hydrolysis products of Lintner starch by bacterial and fungal .**alpha**.-**amylases** after a reaction period of 3 h. Paper chromatog. anal. showed that the cleavage products due to **Fungamyl** action contained more maltose and fewer long-chain dextrins (>G6) than .**alpha**.-**amylase** ZF-178 products. After 23 h, bacterial enzyme hydrolysis products still contained a larger portion of long-chain dextrins, less maltose, but more glucose, maltotriose, and maltotetraose than **Fungamyl** products.

L6 ANSWER 13 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1978:611067 HCAPLUS
DOCUMENT NUMBER: 89:211067
TITLE: Degradation of starch granules by .**alpha**.-**amylases** of fungi
AUTHOR(S): Takaya, T.; Sugimoto, Y.; Imo, E.; Tominaga, Y.; Nakatani, N.; Fuwa, H.
CORPORATE SOURCE: Dep. Food Nutr., Osaka City Univ., Osaka, Japan
SOURCE: Staerke (1978), 30(9), 289-93
CODEN: STRKA6; ISSN: 0038-9056
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The action of 3 prepns. of fungal .**alpha**.-**amylase** (I) on normal corn starch granules and various other types of starch granules was studied. Highly purified I from Streptomyces hygroscopicus SF-1084, highly purified **Aspergillus oryzae** I from Biodiastase, and crystalline A. oryzae I from **Fungamyl** 1600 were used. Starch granules attached enzymically were observed by electron scanning microscopy. The attack on corn granules by the 3 enzymes started with small pits on the surface of granules, the pits increased in size and number, and the pores penetrated into the inner portions toward the center. The optimum pH of degradation was 4.5-5.0 at 37° for 2-h reaction. For corn granules, the main products were maltose and glucose; smaller amts. of higher oligosaccharides were observed throughout the reaction, increasing as the reaction progressed. Maltotriose was not observed at any time. For solid amylase, chromatograms were very similar except for the production of small amts. of maltotriose. For gelatinized amylase, glucose formation was less and increased production of maltotriose and higher oligosaccharides was observed The relative susceptibility of various types of starch granules to fungal I decreased in the order: waxy corn, normal corn, sweet potato, high-amylose corn, mung bean, and potato.

=> s thermostab?

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L7       68103 THERMOSTAB?

=> d his

     (FILE 'HOME' ENTERED AT 14:39:48 ON 28 JUN 2005)

     FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS,
     LIFESCI' ENTERED AT 14:40:24 ON 28 JUN 2005
L1        51978 S ALPHA(W)AMYLASE?
L2        15362 S ASPERGILLUS (W)ORYZAE
L3         2086 S L1 AND L2
L4           93 S FUNGAMYL
L5           14 S L3 AND L4
L6           13 DUP REM L5 (1 DUPLICATE REMOVED)
L7        68103 S THERMOSTAB?

=> s l3 and l7
L8           92 L3 AND L7

=> s dough or brew or beer or alchohol or maltose
L9       150853 DOUGH OR BREW OR BEER OR ALCHOHOL OR MALTOSE

=> s l8 and l9
L10          15 L8 AND L9

=> dup rem l10
PROCESSING COMPLETED FOR L10
L11          11 DUP REM L10 (4 DUPLICATES REMOVED)

=> d 1-11 ibib ab

L11  ANSWER 1 OF 11  HCAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:         2004:534312  HCAPLUS
DOCUMENT NUMBER:          141:67294
TITLE:                    Cloning, purification and characterization of
                          thermostable .alpha.-amylase
                          from Rhizomucor pusillus, and use in liquefying
                          starch, production of alcohol, brewing and baking
INVENTOR(S):              Tang, Lan; Wu, Wenping; Duan, Junxin; Johannesen, Pia
                          Francke
PATENT ASSIGNEE(S):       Novozymes A/S, Den.
SOURCE:                   PCT Int. Appl., 53 pp.
                          CODEN: PIXXD2
DOCUMENT TYPE:            Patent
LANGUAGE:                 English
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.           KIND   DATE        APPLICATION NO.          DATE
     ---------------      ----   --------    --------------------     --------
     WO 2004055178         A1    20040701    WO 2003-DK882            20031216
     WO 2004055178         C2    20041007
         W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH,
             CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,
             GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
             LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO,
             NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ,
             TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
         RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ,
             BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE,
             ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK,
             TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG
PRIORITY APPLN. INFO.:                       DK 2002-1928        A  20021217
```

AB The present inventors have successfully isolated a gene from Rhizomucor pusillus encoding an **alpha-amylase** which they have denoted AM782, they have successfully introduced the encoding gene into a recombinant industrial filamentous fungal expression system, and produced the **alpha-amylase**. Characterization of the amylase has shown it to be a highly thermoacidophilic **alpha-amylase** which has a highly interesting activity as demonstrated by the sugar profile from maltodextrin hydrolysis by amylase AM782. The amylase AM782 can work at a very high temperature, at least up to 70°. The amylase AM782 has a very fast reaction speed; when compared at the same dosage with Fungamyl 800 L, the amylase AM782 can achieve in about 3 h, what takes Fungamyl 24 to 48 h. Purification and characterization of the **alpha-amylase** from Rhizomucor pusillus NN046782 is described. Cloning of the gene encoding the AM782 **alpha-amylase** of Rhizomucor pusillus NN046782 and subcloning and heterologous expression of AM782 amylase is also described. The thermoacidophilic **alpha-amylase** of the invention can be used in starch conversion for liquefaction and saccharification, for liquefying starch in a high **maltose** syrup, for producing alc., for textile desizing, and for brewing and baking.

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 2 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:368675 HCAPLUS

DOCUMENT NUMBER: 136:385041

TITLE: Secondary starch liquefaction in fermentation ethanol production

INVENTOR(S): Veit, Christopher; Felby, Claus; Fuglsang, Claus Crone

PATENT ASSIGNEE(S): Novozymes A/S, Den.; Novozymes North America, Inc.

SOURCE: PCT Int. Appl., 33 pp.
CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
WO 2002038787	A2	20020516	WO 2001-DK737		20011109
WO 2002038787	A3	20020926			
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM					
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG					
AU 2002013841	A5	20020521	AU 2002-13841		20011109
EP 1335982	A2	20030820	EP 2001-982195		20011109
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR					
US 2004091983	A1	20040513	US 2003-416393		20030509
PRIORITY APPLN. INFO.:			DK 2000-1676	A	20001110
			US 2000-252213P	P	20001121
			DK 2000-1854	A	20001211
			US 2000-256015P	P	20001215
			WO 2001-DK737	W	20011109

AB The invention relates to a method of producing ethanol by fermentation, said method comprising a secondary liquefaction step in the presence of a **thermostable** acid **alpha-amylase** or, a

thermostable maltogenic acid **alpha-amylase**.

L11 ANSWER 3 OF 11 EMBASE COPYRIGHT 2005 ELSEVIER INC. ALL RIGHTS RESERVED. on STN DUPLICATE 1

ACCESSION NUMBER: 2002263340 EMBASE
TITLE: Purification and characterisation of amylolytic enzymes from thermophilic fungus Thermomyces lanuginosus strain ATCC 34626.
AUTHOR: Nguyen Q.D.; Rezessy-Szabo J.M.; Claeyssens M.; Stals I.; Hoschke A.
CORPORATE SOURCE: A. Hoschke, Department of Brewing, Szent Istvan University, Menesi ut 45, H-1118 Budapest, Hungary. hoschke@omega.kee.hu
SOURCE: Enzyme and Microbial Technology, (2 Aug 2002) Vol. 31, No. 3, pp. 345-352.
Refs: 23
ISSN: 0141-0229 CODEN: EMTED2
PUBLISHER IDENT.: S 0141-0229(02)00128-X
COUNTRY: United States
DOCUMENT TYPE: Journal; Article
FILE SEGMENT: 004 Microbiology
LANGUAGE: English
SUMMARY LANGUAGE: English
ENTRY DATE: Entered STN: 20020808
Last Updated on STN: 20020808

AB Amylolytic enzymes (.**alpha**.-**amylase** and glucoamylase) from Thermomyces lanuginosus ATCC 34626 were purified to electrophoretic homogeneity. The molecular mass of purified .**alpha**.-**amylase** and glucoamylase were 61 and 75kDa, respectively. Their pI values were calculated to be 3.5-3.6 and 4.1-4.3. The amylolytic enzymes from T. lanuginosus exhibit pH optima in the range 4.6-6.6 in the case of .**alpha**.-**amylase** and 4.4-5.6 in the case of glucoamylase. Both purified enzymes have temperature optima at 70°C. Zn(2+) ions strongly inhibit both enzyme activities. Mn(2+) and Fe(2+) ions are activators in the case of glucoamylase; Ca(2+) and Ba(2+) are activators in the case of .**alpha**.-**amylase**. With half-life times longer than 1 day at 60°C both enzymes prove to be **thermostable** in the pH range 4.5-8.5. The amylolytic enzymes from T. lanuginosus loose activities rapidly when incubated at temperature higher than 80°C or at pH lower than 4.0. Both enzymes are found to be glycosylated; 8.5% carbohydrate in the case of .**alpha**.-**amylase** and 3.3% in the case of glucoamylase. The K(m) and V(max) of .**alpha**.-**amylase** on soluble starch were 0.68mg/ml and 45.19U/mg, respectively. The K(m) values of glucoamylase on **maltose**, maltotriose, maltotetraose, maltopentose and soluble starch were 6.5, 3.5, 2.1, 1.1mM and 0.8mg/ml, respectively. The first 37 residues of N-terminal of the purified .**alpha**.-**amylase** of T. lanuginosus ATCC 34626 were sequenced. Almost complete homology with the .**alpha**.-**amylase** from **Aspergillus oryzae** and Emericella nidulans was observed. .COPYRGT. 2002 Elsevier Science Inc. All rights reserved.

L11 ANSWER 4 OF 11 BIOTECHDS COPYRIGHT 2005 THE THOMSON CORP. on STN

ACCESSION NUMBER: 2001-12290 BIOTECHDS
TITLE: New variant of Fungamyl-like **alpha-amylase**, useful for production of **maltose** syrups, includes mutations that improve stability against heat and acidic pH; plasmid pTAKA17 expression in bacterium cell for syrup production, **dough** improvement, brewing and starch liquefaction
AUTHOR: Bisgard-Frantzen H; SvendSen A; Pedersen S
PATENT ASSIGNEE: Novozymes

LOCATION: Bagsvaerd, Denmark.
PATENT INFO: WO 2001034784 17 May 2001
APPLICATION INFO: WO 2000-DK626 10 Nov 2000
PRIORITY INFO: DK 1999-1617 10 Nov 1999
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: WPI: 2001-367478 [38]

AB A variant (A) of a Fungamyl-like **alpha-amylase** (EC-3.2.1.1) is claimed. (A) has alteration in one of the disclosed amino acid regions. Each alteration is a deletion or substitution of an amino acid an or insertion of an amino acid downstream of a particular position, and (A) retains **alpha-amylase** activity. Also claimed are: DNA construct (II); recombinant expression vector (III); a cell (IV) transformed with the (II) or (III); composition for producing high **maltose** syrup (HMS) or alcohol; **dough** improving or brewing composition; producing (M1) of liquefied starch, HMS or alcohol using (A); producing (M2) variants of Fungamyl-like enzymes with increased **thermostability**; production (M3) of (**maltose**) syrup; and immobilized (A). (A) is used for producing syrups, e.g. of high **maltose** content, or alcohol from starch, as **dough** improver for baked goods, in brewing, to increase fermentability of the wort, and for liquefaction of starch. (47pp)

L11 ANSWER 5 OF 11 SCISEARCH COPYRIGHT (c) 2005 The Thomson Corporation on STN
ACCESSION NUMBER: 1999:317941 SCISEARCH
THE GENUINE ARTICLE: 188EP
TITLE: Thermodynamic stability of a cold-active **alpha-amylase** from the Antarctic bacterium Alteromonas haloplanctis
AUTHOR: Feller G (Reprint); dAmico D; Gerday C
CORPORATE SOURCE: UNIV LIEGE, INST CHEM B6, BIOCHEM LAB, B-4000 LIEGE, BELGIUM (Reprint)
COUNTRY OF AUTHOR: BELGIUM
SOURCE: BIOCHEMISTRY, (6 APR 1999) Vol. 38, No. 14, pp. 4613-4619. Publisher: AMER CHEMICAL SOC, 1155 16TH ST, NW, WASHINGTON, DC 20036.
ISSN: 0006-2960.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE
LANGUAGE: English
REFERENCE COUNT: 48

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB The thermal stability of the cold-active **alpha-amylase** (AHA) secreted by the Antarctic bacterium Alteromonas haloplanctis has been investigated by intrinsic fluorescence, circular dichroism, and differential scanning calorimetry. It was found that this heat-labile enzyme is the largest known multidomain protein exhibiting a reversible two-state unfolding, as demonstrated by the recovery of Delta H-cal values after consecutive calorimetric transitions, a Delta H-cal/Delta H-eff ratio close to unity, and the independence of unfolding thermodynamic parameters of scan rates. By contrast, the mesophilic **alpha-amylases** investigated here (from porcine pancreas, human salivary glands, yellow meal beetle, Bacillus amyloliquefaciens, and Bacillus licheniformis) unfold irreversibly according to a non-two-state mechanism, Unlike mesophilic **alpha-amylases**, the melting point of AHA is independent of calcium and chloride binding while the allosteric and structural functions of these ions are conserved. The **thermostability** of AHA at optimal conditions is characterized by a T-m of 43.7 degrees C, a Delta H-cal of 238 kcal mol(-1), and a Delta C-p of 8.47 kcal mol(-1) K-1. These values were used to calculate the Gibbs free energy of unfolding over a wide range of temperatures. This stability curve shows that (a) the specific Delta G(max) of AHA [22 cal (mol of

residue)(-1)] is 4 times lower than that of mesophilic **alpha-amylases**, (b) group hydration plays a crucial role in the enzyme flexibility at low temperatures, (c) the temperature of cold unfolding closely corresponds to the lower limit of bacterial growth, and (d) the recombinant heat-labile enzyme can be expressed in mesophilic hosts at moderate temperatures. It is also argued that the cold-active **alpha-amylase** has evolved toward the lowest possible conformational stability of its native state.

L11 ANSWER 6 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1990:587055 HCAPLUS
DOCUMENT NUMBER: 113:187055
TITLE: Action pattern and substrate specificity of a **thermostable .alpha.-amylase** from Bacillus apiarius CBML 152
AUTHOR(S): Ghosh, S. B.; Chandra, A. K.
CORPORATE SOURCE: Dep. Bot., Univ. Calcutta, Calcutta, 700 019, India
SOURCE: Annali di Microbiologia ed Enzimologia (1989), 39(Pt. 2), 195-202
CODEN: AMEZAB; ISSN: 0003-4649
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A **thermostable** amylase was purified from a strain of B. apiarius CBML 152 and the enzyme was determined to be as an **.alpha.-amylase** (EC 3.2.1.1; α-1,4-glucan-4-glucanohydrolase). The enzyme could bypass the α-1,6-linkages at branch points and could hydrolyze the starchy substrates completely. The enzyme was a saccharifying type of **.alpha.-amylase** and produced more than 95% reducing sugars as glucose (G1) and **maltose** (G2), along with maltotriose (G3). No maltotetraose was produced. To an extent, the enzyme could hydrolyze the α-1,6-branch points and showed very broad substrate specificity. Kinetic studies revealed that the enzyme had affinity towards both straight chain (amylose-Vm = 66.6 U/mL and Km = 5.8 mg/mL) and branched chain (amylopectin Vm = 71.4 U/mL and Km = 5.0 mg/mL) substrates. The velocity of the enzyme activity, for hydrolysis and sugar production, was very high.

L11 ANSWER 7 OF 11 BIOTECHDS COPYRIGHT 2005 THE THOMSON CORP. on STN
ACCESSION NUMBER: 1987-12537 BIOTECHDS
TITLE: The biotechnological relevance of starch-degrading enzymes; analysis of e.g. **thermostable alpha-amylase**; ethanol production etc.
AUTHOR: Stewart G G
CORPORATE SOURCE: Labatt-Brewing
LOCATION: Production Research Department, Labatt Brewing Company Ltd., London, Ontario, Canada.
SOURCE: Critical Rev.Biotechnol.; (1987) 5, 2, 89-93
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Starch-degrading enzymes of actual or potential industrial importance may be classified into 6 classes with respect to bond hydrolysis. The enzymes described include **alpha-amylases** (EC-3.2.1.1), beta-amylases (EC-3.2.1.2), glucoamylases (EC-3.2.1.3), pullulanase (EC-3.2.1.41) and alpha-glucosidase (EC-3.2.1.20). The commercial use of **thermostable alpha-amylases** is considered, with reference to the enzyme produced by Bacillus amyloliquefaciens and Bacillus licheniformis, and to the production of high **maltose** syrups by **Aspergillus oryzae alpha-amylase**. The enzymatic hydrolysis of starch to fermentable sequences is a coordinated system involving a number of amylolytic enzymes. Future developments with thermophilic amylolytic microorganisms will lead to improvements in enzyme and ethanol production. Ethanol-tolerant mutants of Clostridium thermohydrosulfuricum and

Clostridium thermocellum have been isolated. Future targets will be the selection of ethanol-tolerant, high-yield mutants of amylolytic strains. (8 ref)

L11 ANSWER 8 OF 11 BIOTECHDS COPYRIGHT 2005 THE THOMSON CORP. on STN
ACCESSION NUMBER: 1986-10226 BIOTECHDS
TITLE: Studies on the application of maltogenic amylase in the production of **maltose** containing syrup; use in combination with pullulanase and fungal **alpha-amylase**
AUTHOR: Slominska L; Starogardzka G
LOCATION: Central Laboratorium Przemyslu Ziemniaczanego, Zwierzniecka 18, 60-814 Poznan, Poland.
SOURCE: Starch; (1986) 38, 6, 205-10
CODEN: STARDD
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The **thermostable** and relatively acid stable maltogenic amylase produced by Bacillus stearothermophilus was studied, during an analysis of the advantages of using a maltogenic amylase for **maltose** production during saccharification. Experiments were performed using B. stearothermophilus maltogenic amylase SP 295, with Polish potato starch as the substrate. A slurry of the starch was subjected to liquefaction at 85 deg for 1 hr with Bacillus subtilis **alpha-amylase** (EC-3.2.1.1) (Amylogal CS). The pH was adjusted to 5.0-5.3 and the temperature raised to 105 deg for 15-30 min. Spray-dried maltodextrin was redissolved and saccharified using maltogenic amylase, Bacillus sp. pullulanase (EC-3.2.1.41) and fungal (**Aspergillus oryzae**) **alpha-amylase** at 60 deg for 72 hr. With the maltogenic amylase, potato syrup containing 70-80% **maltose** was obtained from DE 12 enzyme liquefied starch at a concentration of 30-35%. A combination of the 3 saccharifying enzymes gave 85% **maltose**. Maltogenic amylase used with pullulanase increased the **maltose** yield and decreased saccharification time. (10 ref)

L11 ANSWER 9 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1980:72338 HCAPLUS
DOCUMENT NUMBER: 92:72338
TITLE: Degradation of elsinan by .**alpha**.-**amylases**
AUTHOR(S): Tsumuraya, Yoichi; Misaki, Akira
CORPORATE SOURCE: Fac. Sci. Living, Osaka City Univ., Osaka, 558, Japan
SOURCE: Journal of Applied Biochemistry (1979), 1(3), 235-46
CODEN: JABIDV; ISSN: 0161-7354
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Elsinan, a new α-D-glucan consisting of maltotriose and maltotetraose units joined by α-(1→3)-D-glucosidic linkages was degraded by several .**alpha**.-**amylases**, e.g., salivary, hog pancreatic, **Aspergillus oryzae**, and Bacillus subtilis saccharifying .**alpha**.-**amylase**. The action of human salivary .**alpha**.-**amylase** on elsinan resulted in release of O-α-D-glucopyranosyl-(1→3)-O-α-D-glucopyranosyl-(1→4)-D-glucopyranose as a major product together with **maltose** and O-α-D-glucopyranosyl-(1→4)-O-α-D-glucopyranosyl-(1→3)-O-α-D-glucopyranosyl-(1→4)-D-glucopyranose. It is proposed that α-D-glucosidic linkages involving the hydroxyl group at the C-4 position of glucose units whose 1-positions are involved in α-(1→4)-D-glucosidic linkages are preferentially attacked by human salivary .**alpha**.-**amylase**. B. subtilis Liquefying .**alpha**.-**amylase**, a **thermostable** bacterial .**alpha**.-**amylase**,

β-amylase, and glucoamylase did not hydrolyze elsinan. The substrate specificities of .**alpha**.-**amylases** are discussed in relation to their ability to hydrolyze elsinan and the significance of the findings in relation to the application of elsinan as a food additive and pharmaceutical ingredient is considered.

L11 ANSWER 10 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1954:19673 HCAPLUS
DOCUMENT NUMBER: 48:19673
ORIGINAL REFERENCE NO.: 48:3580g-i,3581a-f
TITLE: The use of fungal enzymes for breadmaking purposes
AUTHOR(S): Greup, D. H.; Hintzer, H. M. R.
CORPORATE SOURCE: Central Instituut Voor Voedingsonderzoek T.N.O., Wageningen, The Netherlands
SOURCE: 2nd Intern. Congr. Fermentation Inds. Knocke, Lectures and Communs. (1952) 232-338
DOCUMENT TYPE: Journal
LANGUAGE: Unavailable

AB The need for maintaining an optimum concentration of α- and β-amylase in the process of breadmaking and the suitability of fungal enzyme prepns. for this purpose are discussed. α- and β-Amylases together act on starch and bring about a rapid saccharification which provides the fermentable sugar for the yeast. A deficiency of .**alpha**.-**amylase** limits saccharification and makes the gas production insufficient in the final stages. This deficiency of normal sound flour can be avoided by using flour from sprouted wheat, but owing to its excessive content of dextrins, this has the advantage of making the **dough** and bread crumbs sticky. The long-employed alternative is to supplement the flour with malt-enzyme prepns., but the use of enzyme prepns. from several molds, such as certain strains of **Aspergillus oryzae**, is recently receiving considerable interest. Some characteristic properties of the crystalline fungal .**alpha**.-**amylase**, prepared by fractionation with (NH4)2SO4, are lack of **thermostability**, stability in the cold between pH 4.7 and 7.8, isoelec. point at about 4.0, and nondependence on any ions such as Ca++ for its activity. The effect, on the quality of Dutch white bread, of the use of 2 fungal enzyme prepns., Diastase 33 (I) and Rhozyme-S (II), is studied, the former being highly amylolytic and poorly proteolytic while the latter is a highly amylolytic and a highly proteolytic preparation The results showed that these prepns. when used at suitable levels improved the quality of the bread, while excessive use was detrimental. The results from baking tests were: (1) **Dough** consistency appeared to decrease and **dough**-handling properties improved. This effect was greater in the case of II, since for I the amount of susceptible starch was a limiting factor, while II was not limited by the nature of the gluten substrate. (2) Bread properties such as the color of the crust, loaf volume, and crumb characteristics improved. Crumb compressibility at different storage times was determined by using a panimeter and this showed that softness of the bread had increased. Similarly carried out studies showed that, owing to the effect of I and II, the **maltose** value was raised only slightly while gas production, measured over a period of several hrs., was increased considerably, I being less effective than II. It is suggested that increased gas production, which becomes more pronounced under the action of heat during the first half of the baking process, contributes to better oven spring and improved loaf volume The maximum paste viscosity (measured with a Brabender Amylograph) was hardly affected by the fungal enzymes because of their low inactivation temps. Thus, it is claimed that treatment with fungal enzymes permits the formation of sugars without any appreciable decrease in the viscosity of gelatinized starch. Also, the formation of dextrins at elevated temps. will be held at a min. and the choice of the enzyme level may be less critical than for malt .**alpha**.-**amylase**, which has a relatively high inactivation temperature Other suggested advantages are

increased availability and mild degradation conditions of starch and liberation of bound β-amylase, which increase the rate of starch hydrolysis and gas production. The presence of other factors not included in this study, e.g. the quality of susceptible starch, nature of starch granules and gluten proteins, .**alpha**.-**amylase** content of flour, influence of proteolytic enzymes on bound enzymes, etc. may, of course, influence the response of the flour to fungal enzymes.

L11 ANSWER 11 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1954:19674 HCAPLUS
DOCUMENT NUMBER: 48:19674
ORIGINAL REFERENCE NO.: 48:3580g-i,3581a-f
TITLE: The use of fungal enzymes for breadmaking purposes
AUTHOR(S): Greup, D. H.; Hintzer, H. M. R.
CORPORATE SOURCE: Central Instituut Voor Voedingsonderzoek T.N.O., Wageningen, Neth.
SOURCE: Central Inst. Voedingsonderzoek T.N.O. Afdel. Graan-, Meel-en Broodonderzoek Wageningen, Mededel (1952), No. 44E,
DOCUMENT TYPE: Journal
LANGUAGE: Unavailable

AB The need for maintaining an optimum concentration of α- and β-amylase in the process of breadmaking and the suitability of fungal enzyme prepns. for this purpose are discussed. α- and β-Amylases together act on starch and bring about a rapid saccharification which provides the fermentable sugar for the yeast. A deficiency of .**alpha**.-**amylase** limits saccharification and makes the gas production insufficient in the final stages. This deficiency of normal sound flour can be avoided by using flour from sprouted wheat, but owing to its excessive content of dextrins, this has the advantage of making the **dough** and bread crumbs sticky. The long-employed alternative is to supplement the flour with malt-enzyme prepns., but the use of enzyme prepns. from several molds, such as certain strains of **Aspergillus oryzae**, is recently receiving considerable interest. Some characteristic properties of the crystalline fungal .**alpha**.-**amylase**, prepared by fractionation with (NH4)2SO4, are lack of **thermostability**, stability in the cold between pH 4.7 and 7.8, isoelec. point at about 4.0, and nondependence on any ions such as Ca++ for its activity. The effect, on the quality of Dutch white bread, of the use of 2 fungal enzyme prepns., Diastase 33 (I) and Rhozyme-S (II), is studied, the former being highly amylolytic and poorly proteolytic while the latter is a highly amylolytic and a highly proteolytic preparation The results showed that these prepns. when used at suitable levels improved the quality of the bread, while excessive use was detrimental. The results from baking tests were: (1) **Dough** consistency appeared to decrease and **dough**-handling properties improved. This effect was greater in the case of II, since for I the amount of susceptible starch was a limiting factor, while II was not limited by the nature of the gluten substrate. (2) Bread properties such as the color of the crust, loaf volume, and crumb characteristics improved. Crumb compressibility at different storage times was determined by using a panimeter and this showed that softness of the bread had increased. Similarly carried out studies showed that, owing to the effect of I and II, the **maltose** value was raised only slightly while gas production, measured over a period of several hrs., was increased considerably, I being less effective than II. It is suggested that increased gas production, which becomes more pronounced under the action of heat during the first half of the baking process, contributes to better oven spring and improved loaf volume The maximum paste viscosity (measured with a Brabender Amylograph) was hardly affected by the fungal enzymes because of their low inactivation temps. Thus, it is claimed that treatment with fungal enzymes permits the formation of sugars without any appreciable decrease in the viscosity of gelatinized starch. Also, the formation of dextrins at elevated temps.

will be held at a min. and the choice of the enzyme level may be less critical than for malt .**alpha**.-**amylase**, which has a relatively high inactivation temperature Other suggested advantages are increased availability and mild degradation conditions of starch and liberation of bound β-amylase, which increase the rate of starch hydrolysis and gas production. The presence of other factors not included in this study, e.g. the quality of susceptible starch, nature of starch granules and gluten proteins, .**alpha**.-**amylase** content of flour, influence of proteolytic enzymes on bound enzymes, etc. may, of course, influence the response of the flour to fungal enzymes.

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     (FILE 'HOME' ENTERED AT 14:39:48 ON 28 JUN 2005)

     FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS,
     LIFESCI' ENTERED AT 14:40:24 ON 28 JUN 2005
L1         51978 S ALPHA(W)AMYLASE?
L2         15362 S ASPERGILLUS (W)ORYZAE
L3          2086 S L1 AND L2
L4            93 S FUNGAMYL
L5            14 S L3 AND L4
L6            13 DUP REM L5 (1 DUPLICATE REMOVED)
L7         68103 S THERMOSTAB?
L8            92 S L3 AND L7
L9        150853 S DOUGH OR BREW OR BEER OR ALCHOHOL OR MALTOSE
L10           15 S L8 AND L9
L11           11 DUP REM L10 (4 DUPLICATES REMOVED)

=> s l2 and immobiliz?
L12          811 L2 AND IMMOBILIZ?

=> s l4 and l12
L13           2 L4 AND L12

=> d 1-2 ibib ab

L13   ANSWER 1 OF 2  BIOTECHDS COPYRIGHT 2005 THE THOMSON CORP. on STN
ACCESSION NUMBER: 2001-12290  BIOTECHDS
TITLE:            New variant of Fungamyl-like alpha-amylase, useful
                  for production of maltose syrups, includes mutations that
                  improve stability against heat and acidic pH;
                     plasmid pTAKA17 expression in bacterium cell for syrup
                     production, dough improvement, brewing and starch
                     liquefaction
AUTHOR:           Bisgard-Frantzen H; SvendSen A; Pedersen S
PATENT ASSIGNEE:  Novozymes
LOCATION:         Bagsvaerd, Denmark.
PATENT INFO:      WO 2001034784 17 May 2001
APPLICATION INFO: WO 2000-DK626 10 Nov 2000
PRIORITY INFO:    DK 1999-1617 10 Nov 1999
DOCUMENT TYPE:    Patent
LANGUAGE:         English
OTHER SOURCE:     WPI: 2001-367478 [38]
AB    A variant (A) of a Fungamyl-like alpha-amylase (EC-3.2.1.1) is
      claimed.  (A) has alteration in one of the disclosed amino acid regions.
      Each alteration is a deletion or substitution of an amino acid an or
      insertion of an amino acid downstream of a particular position, and (A)
      retains alpha-amylase activity.  Also claimed are: DNA construct (II);
      recombinant expression vector (III); a cell (IV) transformed with the
      (II) or (III); composition for producing high maltose syrup (HMS) or
      alcohol; dough improving or brewing composition; producing (M1) of
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liquefied starch, HMS or alcohol using (A); producing (M2) variants of **Fungamyl**-like enzymes with increased thermostability; production (M3) of (maltose) syrup; and **immobilized** (A). (A) is used for producing syrups, e.g. of high maltose content, or alcohol from starch, as dough improver for baked goods, in brewing, to increase fermentability of the wort, and for liquefaction of starch. (47pp)

L13 ANSWER 2 OF 2 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2001:360158 HCAPLUS
DOCUMENT NUMBER: 134:363353
TITLE: **Fungamyl**-like **Aspergillus oryzae** α-amylase variants with improved thermal stability and applications to starch processes
INVENTOR(S): Bisgard-Frantzen, Henrik; Svendsen, Allan; Pedersen, Sven
PATENT ASSIGNEE(S): Novozymes A/S, Den.
SOURCE: PCT Int. Appl., 48 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001034784	A1	20010517	WO 2000-DK626	20001110
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
AU 2001012696	A5	20010606	AU 2001-12696	20001110
EP 1230351	A1	20020814	EP 2000-974351	20001110
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
JP 2003513666	T2	20030415	JP 2001-537481	20001110
US 2004229764	A1	20041118	US 2004-820200	20040407
PRIORITY APPLN. INFO.:			DK 1999-1617 A	19991110
			US 1999-165786P P	19991116
			US 2000-710339 A1	20001109
			WO 2000-DK626 W	20001110

AB The invention relates to a variant of a parent **Fungamyl**-like fungal α-amylase, which exhibits improved thermal stability at acidic pH suitable for, e.g., starch processes. Cloning, amino acid and encoding nucleotide sequences, and mutagenesis of α-amylase from **Aspergillus oryzae** are provided. Construction of variant Q153S α-amylase (Q173S pre-α-amylase) from A. oryzae is disclosed.
REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d his

(FILE 'HOME' ENTERED AT 14:39:48 ON 28 JUN 2005)

FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS, LIFESCI' ENTERED AT 14:40:24 ON 28 JUN 2005
L1 51978 S ALPHA(W)AMYLASE?

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L2        15362 S ASPERGILLUS (W)ORYZAE
L3         2086 S L1 AND L2
L4           93 S FUNGAMYL
L5           14 S L3 AND L4
L6           13 DUP REM L5 (1 DUPLICATE REMOVED)
L7        68103 S THERMOSTAB?
L8           92 S L3 AND L7
L9       150853 S DOUGH OR BREW OR BEER OR ALCHOHOL OR MALTOSE
L10          15 S L8 AND L9
L11          11 DUP REM L10 (4 DUPLICATES REMOVED)
L12         811 S L2 AND IMMOBILIZ?
L13           2 S L4 AND L12

=> e bisgard-frantzen h/au
E1            1     BISGARD P/AU
E2            1     BISGARD POUL/AU
E3            0 --> BISGARD-FRANTZEN H/AU
E4            2     BISGARDFRANTZEN H/AU
E5            1     BISGAWA F/AU
E6            2     BISGAY K/AU
E7            1     BISGAY L/AU
E8            6     BISGEIER G/AU
E9           10     BISGEIER G P/AU
E10           1     BISGEIER GEORGE/AU
E11           2     BISGES A/AU
E12          16     BISGES A D/AU

=> s e4
L14           2 "BISGARDFRANTZEN H"/AU

=> e svendsen a/au
E1            1     SVENDSE F/AU
E2            6     SVENDSEN/AU
E3          375 --> SVENDSEN A/AU
E4            1     SVENDSEN A A/AU
E5          363     SVENDSEN A B/AU
E6          109     SVENDSEN A BAERHEIM/AU
E7            1     SVENDSEN A BARHEIM/AU
E8           17     SVENDSEN A J/AU
E9           12     SVENDSEN A K/AU
E10           1     SVENDSEN A L/AU
E11           4     SVENDSEN A M/AU
E12           3     SVENDSEN A M B/AU

=> s e3
L15         375 "SVENDSEN A"/AU

=> e pedersen s/au
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E2            1     PEDERSEN RUTH L/AU
E3         1367 --> PEDERSEN S/AU
E4            4     PEDERSEN S */AU
E5          553     PEDERSEN S A/AU
E6            7     PEDERSEN S A S/AU
E7            1     PEDERSEN S ANKER/AU
E8          402     PEDERSEN S B/AU
E9            1     PEDERSEN S BOEL/AU
E10          64     PEDERSEN S C/AU
E11          15     PEDERSEN S D/AU
E12         185     PEDERSEN S E/AU

=> s e3
L16        1367 "PEDERSEN S"/AU
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=> s l14 or l15 or l16
L17       1742 L14 OR L15 OR L16

=> d his

     (FILE 'HOME' ENTERED AT 14:39:48 ON 28 JUN 2005)

     FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS,
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L2         15362 S ASPERGILLUS (W)ORYZAE
L3          2086 S L1 AND L2
L4            93 S FUNGAMYL
L5            14 S L3 AND L4
L6            13 DUP REM L5 (1 DUPLICATE REMOVED)
L7         68103 S THERMOSTAB?
L8            92 S L3 AND L7
L9        150853 S DOUGH OR BREW OR BEER OR ALCHOHOL OR MALTOSE
L10           15 S L8 AND L9
L11           11 DUP REM L10 (4 DUPLICATES REMOVED)
L12          811 S L2 AND IMMOBILIZ?
L13            2 S L4 AND L12
                 E BISGARD-FRANTZEN H/AU
L14            2 S E4
                 E SVENDSEN A/AU
L15          375 S E3
                 E PEDERSEN S/AU
L16         1367 S E3
L17         1742 S L14 OR L15 OR L16

=> s l3 and l17
L18            5 L3 AND L17

=> dup rem l18
PROCESSING COMPLETED FOR L18
L19            3 DUP REM L18 (2 DUPLICATES REMOVED)

=> d 1-3 ibib ab

L19   ANSWER 1 OF 3  BIOTECHDS COPYRIGHT 2005 THE THOMSON CORP. on STN
ACCESSION NUMBER: 2001-12290  BIOTECHDS
TITLE:            New variant of Fungamyl-like alpha-amylase
                  , useful for production of maltose syrups, includes mutations
                  that improve stability against heat and acidic pH;
                     plasmid pTAKA17 expression in bacterium cell for syrup
                     production, dough improvement, brewing and starch
                     liquefaction
AUTHOR:           Bisgard-Frantzen H; SvendSen A; Pedersen S
PATENT ASSIGNEE:  Novozymes
LOCATION:         Bagsvaerd, Denmark.
PATENT INFO:      WO 2001034784 17 May 2001
APPLICATION INFO: WO 2000-DK626 10 Nov 2000
PRIORITY INFO:    DK 1999-1617 10 Nov 1999
DOCUMENT TYPE:    Patent
LANGUAGE:         English
OTHER SOURCE:     WPI: 2001-367478 [38]
AB    A variant (A) of a Fungamyl-like alpha-amylase
      (EC-3.2.1.1) is claimed.  (A) has alteration in one of the disclosed
      amino acid regions.  Each alteration is a deletion or substitution of an
      amino acid an or insertion of an amino acid downstream of a particular
      position, and (A) retains alpha-amylase activity.
      Also claimed are: DNA construct (II); recombinant expression vector
```

(III); a cell (IV) transformed with the (II) or (III); composition for producing high maltose syrup (HMS) or alcohol; dough improving or brewing composition; producing (M1) of liquefied starch, HMS or alcohol using (A); producing (M2) variants of Fungamyl-like enzymes with increased thermostability; production (M3) of (maltose) syrup; and immobilized (A). (A) is used for producing syrups, e.g. of high maltose content, or alcohol from starch, as dough improver for baked goods, in brewing, to increase fermentability of the wort, and for liquefaction of starch. (47pp)

L19 ANSWER 2 OF 3 EMBASE COPYRIGHT 2005 ELSEVIER INC. ALL RIGHTS RESERVED. on STN DUPLICATE 1

ACCESSION NUMBER: 2000374774 EMBASE
TITLE: Expression and characterization of a recombinant Fusarium spp. galactose oxidase.
AUTHOR: Xu F.; Golightly E.J.; Schneider P.; Berka R.M.; Brown K.M.; Johnstone J.A.; Baker D.H.; Fuglsang C.C.; Brown S.H.; **Svendsen A.**; Klotz A.V.
CORPORATE SOURCE: F. Xu, Novo Nordisk Biotech, 1445 Drew Avenue, Davis, CA 95616, United States. fengxu@nnbt.com
SOURCE: Applied Biochemistry and Biotechnology - Part A Enzyme Engineering and Biotechnology, (2000) Vol. 88, No. 1-3, pp. 23-32.
Refs: 16
ISSN: 0273-2289 CODEN: ABIBDL
COUNTRY: United States
DOCUMENT TYPE: Journal; Conference Article
FILE SEGMENT: 029 Clinical Biochemistry
LANGUAGE: English
SUMMARY LANGUAGE: English
ENTRY DATE: Entered STN: 20001116
Last Updated on STN: 20001116

AB The Fusarium spp. (Dactylium dendroides) galactose oxidase was expressed in **Aspergillus oryzae** and Fusarium venenatum hosts. Under the control of an A. niger .**alpha**.-**amylase** or a Fusarium trypsin promoter, high level galactose oxidase expression was achieved. The recombinant oxidase expressed in the A. oryzae host was purified and characterized. The purified enzyme had a molecular weight of 66 kDa on sodium dodecyl sulfate-polymerase gel electrophoresis (SDS-PAGE) and 0.4 mol copper atom per mole protein. The stoichiometry increased to 1.2 after a Cu saturation. Based on a peroxidase-coupled assay, the enzyme preparation showed an activity of 440 turnover per second toward D-galactose (0.1 M) at pH 7 and 20°C. The enzyme had an optimal temperature of 60°C at pH 6.0 and an activation free Gibbs energy of 33 kJ/mol. A series of D-galactose derivatives was tested as the reducing substrate for the oxidase. The difference in activity was interpreted by the stereospecificity of the oxidase toward the substituents in the pyranose substrate, particularly on the C5 and the cyclic hemiacetal O sites. The recombinant oxidase could act on some galactose-containing polysaccharides, such as guar gum, but was not able to oxidize several common redox compounds that lacked a primary alcohol functional group.

L19 ANSWER 3 OF 3 BIOTECHDS COPYRIGHT 2005 THE THOMSON CORP. on STN

ACCESSION NUMBER: 1996-12567 BIOTECHDS
TITLE: New **alpha-amylase** variants; mutant enzyme construction for improved calcium dependency, substrate binding, cleavage, pH dependent activity and thermostability; application in e.g. surfactant composition
AUTHOR: **Svendsen A**; Bisgard-Frantzen H; Borchert T V
PATENT ASSIGNEE: Novo-Nordisk
LOCATION: Bagsvaerd, Denmark.

PATENT INFO: WO 9623874 8 Aug 1996
APPLICATION INFO: WO 1996-DK57 5 Feb 1996
PRIORITY INFO: DK 1995-1256 10 Nov 1995; DK 1995-128 3 Feb 1995
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: WPI: 1996-371424 [37]
AB A method for constructing a Termamyl-like **alpha-amylase** (TAA) mutant is new in which the variant has **alpha-amylase** (AA, EC-3.2.1.1) activity and at least one altered property as compared to the parent AA. The method involves: analyzing the structure of TAA to identify an amino acid residue or structural part which alters the property; constructing a TAA variant; and testing the variant for the property. Also claimed are: a method of constructed a variant which has decreased calcium ion dependency, altered pH dependent activity, increased thermostability and reduced ability to cleave a substrate close to the branching point. The variants can be used as surfactants or for desizing or starch liquefaction. They can also be used for the production of sweeteners and ethanol from starch. (171pp)

=> d his'
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or the STNGUIDE file for information on formats available in
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(FILE 'HOME' ENTERED AT 14:39:48 ON 28 JUN 2005)

FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS, LIFESCI' ENTERED AT 14:40:24 ON 28 JUN 2005

L1	51978	S ALPHA(W)AMYLASE?
L2	15362	S ASPERGILLUS (W)ORYZAE
L3	2086	S L1 AND L2
L4	93	S FUNGAMYL
L5	14	S L3 AND L4
L6	13	DUP REM L5 (1 DUPLICATE REMOVED)
L7	68103	S THERMOSTAB?
L8	92	S L3 AND L7
L9	150853	S DOUGH OR BREW OR BEER OR ALCHOHOL OR MALTOSE
L10	15	S L8 AND L9
L11	11	DUP REM L10 (4 DUPLICATES REMOVED)
L12	811	S L2 AND IMMOBILIZ?
L13	2	S L4 AND L12
		E BISGARD-FRANTZEN H/AU
L14	2	S E4
		E SVENDSEN A/AU
L15	375	S E3
		E PEDERSEN S/AU
L16	1367	S E3
L17	1742	S L14 OR L15 OR L16
L18	5	S L3 AND L17
L19	3	DUP REM L18 (2 DUPLICATES REMOVED)

	L #	Hits	Search Text
1	L1	8206	alpha adj amylase$2
2	L2	2409	aspergillus adj oryzae
3	L3	504	l1 same l2
4	L4	158	fungamyl
5	L5	15	l3 same l4
6	L6	887	"98-110" or "161-167"
7	L7	1	l5 and l6
8	L8	66094	brew or beer or dough or alchohol or maltose
9	L9	23	l3 same l8
10	L10	1	"5989169".pn.
11	L11	11077	BISGARD-FRANTZEN-HENRIK SVENDSEN PEDERSEN
12	L13	9	l4 and l12
13	L12	78	l3 and l11

	Issue Date	Pages	Document ID	Title
1	20050512	30	US 20050100996 A1	Methods for producing ethanol from carbon substrates
2	20050127	58	US 20050019886 A1	Alpha-amylase variants
3	20041118	17	US 20040229764 A1	Fungamyl-like alpha-amylase variants
4	20030925	28	US 20030180900 A1	Methods for producing ethanol from carbon substrates
5	20030911	64	US 20030170769 A1	Alpha-amylase mutants
6	20021219	6	US 20020192291 A1	Amylose products as matrix former for programmed release systems, process for preparing these amylose products, and process for making programmed release systems
7	20020523	16	US 20020061476 A1	Protective overcoat for an imaging element comprising an enzyme-treated biopolymer
8	20050118	6	US 6844172 B2	Amylose products as matrix former for programmed release systems, process for preparing these amylose products, and process for making programmed release systems
9	20020827	99	US 6440716 B1	.alpha.-amylase mutants
10	20020618	15	US 6406838 B1	Protective overcoat for an imaging element comprising an enzyme-treated biopolymer

	Issue Date	Pages	Document ID	Title
11	20020423	5	US 6376219 B1	Amylose products as matrix former for programmed release systems, process for preparing these amylose products, and process for making programmed release systems
12	20010828	15	US 6280912 B1	Protective overcoat for an imaging element comprising an enzyme-treated biopolymer
13	20000208	100	US 6022724 A	.alpha.-amylase mutants
14	19991123	100	US 5989169 A	.alpha.-amylase mutants
15	19980915	5	US 5807578 A	Fast-melt tablet and method of making same

	Issue Date	Pages	Document ID	Title
1	20041118	17	US 20040229764 A1	Fungamyl-like alpha-amylase variants

	Issue Date	Pages	Document ID	Title
1	20050512	30	US 20050100996 A1	Methods for producing ethanol from carbon substrates
2	20041118	17	US 20040229764 A1	Fungamyl-like alpha-amylase variants
3	20041007	138	US 20040197854 A1	Methods for modifying the production of a polypeptide
4	20040909	23	US 20040176317 A1	Functionalised maltosyl fluoride as glycosyl donor in the chemo-enzymatic preparation of ratio of oligo-or polysaccharides
5	20040909	131	US 20040175814 A1	Novel transferase and amylase, process for producing the enzymes, use thereof, and gene coding for the same
6	20040812	37	US 20040157301 A1	Methods for producing end-products from carbon substrates
7	20031030	37	US 20030203454 A1	Methods for producing end-products from carbon substrates
8	20030925	28	US 20030180900 A1	Methods for producing ethanol from carbon substrates
9	20030925	34	US 20030180416 A1	Carbohydrate oxidase and use thereof in baking
10	20030501	133	US 20030082595 A1	Nucleic acids of aspergillus fumigatus encoding industrial enzymes and methods of use
11	20050531	30	US 6900039 B2	Carbohydrate oxidase and use thereof in baking
12	20020521	119	US 6391595 B1	Transferase and amylase, process for producing the enzymes, use thereof, and gene coding for the same

	Issue Date	Pages	Document ID	Title
13	20011127	129	US 6323002 B1	Methods for modifying the production of a polypeptide
14	20010703	5	US 6254903 B1	Process for making baked articles that retain freshness
15	20010206	21	US 6184011 B1	Method of releasing solid matrix affinity adsorbed particulates
16	20001226	30	US 6165761 A	Carbohydrate oxidase and use thereof in baking
17	19990928	131	US 5958727 A	Methods for modifying the production of a polypeptide
18	19980630	4	US 5773055 A	Process for preparing a bean flavor
19	19961231	6	US 5589207 A	Method of producing a frozen yeast dough product
20	19950613	7	US 5424299 A	Composition and method for rejuvenating enteral feeding tubes
21	19911022	8	US 5059430 A	Enzyme composition for retarding staling of baked goods
22	19820223	14	US 4316956 A	Fermentation process
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1	20050519	20	US 20050107332 A1	Starch process
2	20050127	58	US 20050019886 A1	Alpha-amylase variants
3	20041118	17	US 20040229764 A1	Fungamyl-like alpha-amylase variants
4	20030911	64	US 20030170769 A1	Alpha-amylase mutants
5	20020214	27	US 20020019009 A1	High throughput screening (HTS) assays
6	20020827	99	US 6440716 B1	.alpha.-āmylase mutants
7	20000208	100	US 6022724 A	.alpha.-amylase mutants
8	19991123	100	US 5989169 A	.alpha.-amylase mutants
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1	20050602	53	US 20050118695 A1	Alpha-amylase mutants
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8	20050127	58	US 20050019886 A1	Alpha-amylase variants
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10	20041202	28	US 20040241820 A1	Subtilase enzymes
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16	20040624	140	US 20040123339 A1	Nucleic acid molecules and other molecules associated with transcription in plants
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18	20040617	196	US 20040116682 A1	Nucleic acid molecules and other molecules associated with the carbon assimilation pathway
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22	20031127	63	US 20030220394 A1	Sequences
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25	20030918	133	US 20030176328 A1	Adiponectin fragments and conjugates
26	20030918	50	US 20030175241 A1	Interferon-beta variants and conjugates
27	20030918	50	US 20030175240 A1	Interferon-beta variants and conjugates
28	20030911	50	US 20030171236 A1	ALPHA-AMYLASE MUTANTS

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35	20030123	49	US 20030018175 A1	Protein C or activated protein C-like molecules
36	20021226	21	US 20020197682 A1	Methods for producing polypeptides in Aspergillus mutant cells
37	20021114	47	US 20020169290 A1	New multimeric interferon beta polypeptides
38	20021107	23	US 20020164723 A1	Method of producing saccharide preparations
39	20020926	38	US 20020137160 A1	Nucleic acid and other molecules associated with lactation and muscle and fat deposition
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45	20041207	19	US 6828137 B2	Methods for producing polypeptides in aspergillus mutant cells
46	20041019	36	US 6806063 B2	Factor VII or VIIa-like molecules
47	20040727	27	US 6767701 B1	Methods of constructing and screening a DNA library of interest in filamentous fungal cells
48	20040420	59	US 6723837 B1	Nucleic acid molecule and encoded protein associated with sterol synthesis and metabolism
49	20031104	45	US 6642044 B2	.alpha.-amylase mutants
50	20030923	51	US 6623948 B1	Nucleic acid sequences encoding alkaline alpha-amylases
51	20030506	45	US 6558939 B1	Proteases and variants thereof
52	20030408	24	US 6544765 B1	Oxaloacetate hydrolase deficient fungal host cells
53	20030311	43	US 6531122 B1	Interferon-.beta. variants and conjugates
54	20030304	63	US 6528298 B1	.alpha.-amylase mutants
55	20020827	99	US 6440716 B1	.alpha.-amylase mutants
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59	20020326	64	US 6361989 B1	.alpha.-amylase and .alpha.-amylase variants
60	20011016	19	US 6303346 B1	Method of producing saccharide preparations
61	20010724	57	US 6265197 B1	Starch debranching enzymes
62	20010626	53	US 6251626 B1	Recombinant hexose oxidase, a method of producing same and use of such enzyme
63	20010403	39	US 6211134 B1	Mutant .alpha.-amylase
64	20010320	51	US 6204232 B1	.alpha.-amlase mutants
65	20010306	36	US 6197565 B1	.alpha.-Amylase variants
66	20010213	37	US 6187578 B1	Carboxypeptidases and nucleic acids encoding the same
67	20010213	31	US 6187576 B1	.alpha.-amylase mutants
68	20001107	47	US 6143708 A	.alpha.-amylase mutants
69	20001024	15	US 6136571 A	Method of producing saccharide preparations
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72	20000208	100	US 6022724 A	.alpha.-amylase mutants
73	19991123	100	US 5989169 A	.alpha.-amylase mutants
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77	19980519	50	US 5753460 A	Amylase variants
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